CLAIMS:

1. A programmable lithographic mask (100) for use in an optical lithographic setup (300) using a lithographic illumination source (324), said programmable mask (100) comprising a number of pixels, each pixel comprising a first, non-polar fluid (110) that is not transparent for the lithographic illumination source (324) and a second, polar fluid (112) that is transparent for the lithographic illumination source (324), said fluids being immiscible; said programmable lithographic mask (100) furthermore comprising means (306) for driving every pixel to thereby displace said first and second fluids with respect to each other on a pixel-by-pixel basis.

2. A programmable lithographic mask (100) according to claim 1, furthermore comprising a reservoir having walls transparent for the radiation from the lithographic illumination source (324) and containing said first, non-polar fluid (110) and said second, polar fluid (112).

3. A programmable lithographic mask (100) according to claim 2, wherein one of said walls is a lyophobic wall, repelling said second, polar fluid (112).

4. A programmable lithographic mask (100) according to claim 1, said pixels furthermore each comprising an electrode (102) , for applying an electric field to said fluids.

5. A programmable lithographic mask (100) according to claim 4, wherein the electrodes (102) are transparent for the radiation from the lithographic illumination source.

6. A programmable lithographic mask (100) according to claim 4 comprising a reflective coating.

7. A programmable lithographic mask (100) according to claim 1, wherein said means for driving (306) every pixel is means for active matrix driving.

8. A programmable lithographic mask (100) according to claim 1, wherein said means for driving (306) every pixel is means for passive matrix driving.

9. A programmable lithographic mask (100) according to claim 1, wherein said first, non-polar fluid (110) is an oil and said second, polar fluid (112) is an aqueous solution or water.

10. A programmable lithographic mask (100) according to claim 1, furthermore comprising means for providing a fixed, non-programmable pattern in a number of areas of said programmable lithographic mask.

11. A system for maskless optical lithography (300), said system comprising
- an illumination source (324),
- a programmable lithographic mask (100) according to claim 1, and
- controlling and driving means (306) for setting said programmable lithographic mask (100) -according to a lithographic pattern and for driving said pixels of said programmable lithographic mask (100) in accordance with the pattern.

12. A system for maskless optical lithography (300) according to claim 11, furthermore comprising a first optical means (326) for focussing an illumination beam of said illumination source (324).

13. A system for maskless optical lithography (300) according to claim 12 wherein said focussing an illumination beam is performed based on the Köhler principle.

14. A system for maskless optical lithography (300) according to claim 11, furthermore comprising a second optical means (302) for guiding and focussing said illumination beam, modulated according to said lithographic pattern of the programmable lithographic mask (100).

15. A system for maskless optical lithography (300) according to claim 11, further comprising means for aligning (310) said substrate (314) relative to said programmable lithographic mask (100).

16. A system for maskless optical lithography (300) according to any of claims 11 or 15, further comprising a blocking means for blocking said illumination beam during alignment and during setting of the programmable lithographic mask (100).

17. A system for maskless optical lithography (300) according to any of claims 11 to 16 wherein said first and second optical means are based on mirrors, beamsplitters and/or lenses.

18. A system for maskless optical lithography (300) according to claims 11, wherein said pixels of said electro-wetting mask (100) furthermore comprise means to reflect the illumination beam that has passed the first and/or the second fluid.

19. A method for performing an optical lithographic step on a substrate, comprising the steps of

- providing a digital pattern to a controlling and driving means (306) of an electro-wetting mask (100), and
- using the digital pattern to modulate a light pattern by means of the electro-wetting mask (100), and
- illuminating the substrate (314) through the electro-wetting mask (100).

20. A method according to claim 19, further comprising mounting the substrate (314) on an substrate stage (310) and aligning the substrate relative to the electro-wetting mask (100).

21. A method according to claim 19, further comprising coating the substrate (314) with a photosensitive material (316) before illumination of the substrate (314).

22. A method according to claim 20, wherein during said illuminating of the substrate (314), the electro-wetting mask (100) and the substrate (314) are moved in the same direction or the electro-wetting mask (100) and the substrate (314) are moved in opposite directions.

23. A method according to claim 20, wherein said illuminating is performed by scanning the electro-wetting mask (100) with a narrow beam and at the same time shifting

the substrate (314) accordingly, to illuminate the substrate (314) with the corresponding lithographic pattern.

24. A method for labelling a substrate (314) in an optical lithographic step, comprising the steps of

- providing at least one unique identification label in a digital pattern in order to provide every substrate (314) with that unique identification label.
- providing said digital pattern to a controlling and driving means of an electro-wetting mask (100), and
- using the digital pattern to modulate a light pattern by means of the electro-wetting mask (100), and
- illuminating the substrate through the electro-wetting mask (100).

25. A method according to claim 24, furthermore comprising, providing unique identification labels in the digital pattern in order to provide every die on a substrate (314) with a unique identification label.

26. A method according to claim 25 wherein said unique identification labels in the digital pattern are refreshed during optical lithography of a plurality of substrates (314), as to provide a unique identification label for every die of said plurality of substrates (314).

27. A method of making a device, said method comprising

- providing a photoresist layer (316) on a layer which is to be patterned
- illuminating the photoresist layer (316) with a corresponding pattern obtained by modulating an illumination source with an electro-wetting mask (100)
- developing said photoresist layer (316)
- processing the substrate (314) to obtain the patterned layer.